In the claims:

For the Examiner's convenience, all pending claims are presented below with changes shown in accordance with the new mandatory amendment format.

1.   (Currently Amended) A method, comprising:

analyzing code associated with a language implementation system using bitwise constant propagation;

determining, based on the analyzed code, ~~when~~ whether an operation on a larger data type may be replaced by ~~the~~ an operation on a smaller data type having a reduced precision, wherein the operation on the larger data type is contained in the code ~~associated with a language implementation system~~; and

replacing the operation on the larger data type by the operation on the smaller data type as determined.

2.   (Currently Amended) The method of claim 1, further comprising:

determining ~~when~~ whether a first variable of the larger data type may be replaced by a second variable of a smaller data type having the reduced precision; and

replacing the first variable of the larger data type by the second variable of the smaller data type as determined.

3.   (Original)   The method of claim 2, wherein replacing the operation and replacing the first variable are used for automatic vectorization for signal and media processors that provide vector operations on small fixed-point data types.

4.   (Currently Amended) The method of claim 3, wherein the processors are equipped to provide MMX instructions equipped.

5.   (Currently Amended) The method of claim 3, wherein the processors are equipped to provide SSE instructions equipped.

6.   (Original)   The method of claim 3, further comprising performing algebraic simplification on the code.

7.   (Currently Amended) The method of claim 6, wherein the language implementation system performs the bitwise constant propagation by abstract interpretation on the code.

8.   (Currently Amended) A computer-readable medium having stored thereon a plurality of instructions, said plurality of instructions when executed by a computer, cause said computer to perform:

    analyzing code associated with a language implementation system using bitwise

        constant propagation;

    determining, based on the analyzed code, when whether an operation on a larger

        data type may be replaced by the an operation on a smaller data type having a

reduced precision, wherein the operation <u>on the larger data type</u> is contained

in <u>the</u> code ~~associated with a language implementation system~~; and

replacing the operation on the larger data type by the operation on the smaller data

type <u>as determined</u>.

9.   (Currently Amended) The computer-readable medium of claim 8 having stored

thereon additional instructions, said additional instructions when executed by a computer

for optimizing, cause said computer to further perform:

determining ~~when~~ <u>whether</u> a first variable of the larger data type may be replaced

by a second variable of a smaller data type having the reduced precision; and

replacing the first variable of the larger data type by the second variable of the

smaller data type <u>as determined</u>.

10.   (Original)   The computer-readable medium of claim 9 wherein replacing the

operation and replacing the first variable are used for automatic vectorization for signal

and media processors that provide vector operations on small fixed-point data types.

11.   (Currently Amended) The computer-readable medium of claim 10, wherein the

processors are <u>equipped to provide</u> MMX instructions ~~equipped~~.

12.   (Currently Amended) The computer-readable medium of claim 10, wherein the

processors are <u>equipped to provide</u> SSE instructions ~~equipped~~.

13. (Original) The computer-readable medium of claim 10, having stored thereon additional instructions, said additional instructions when executed by a computer for optimizing, cause said computer to further perform performing algebraic simplification on the code.

14. (Currently Amended) The computer-readable medium of claim 13, wherein the language implementation system performs the bitwise constant propagation by abstract interpretation on the code.

15. (Currently Amended) A system, comprising:

   a processor;

   memory connected to the processor storing instructions for type demotion of

      expressions and variables by bitwise constant propagation executed by the

      processor;

   storage connected to the processor that stores a software code having a plurality

      of separately compilable routines,

   wherein the processor executes the instructions on the code to

      analyzing code associated with a language implementation system using

         bitwise constant propagation;

      determine, based on the analyzed code, when whether an operation on a larger

         data type may be replaced by the an operation on a smaller data type

         having a reduced precision, wherein the operation on the larger data type

is contained in the code ~~associated with a language implementation~~

~~system~~; and

replace the operation on the larger data type by the operation on the smaller

data type as determined.

16.   (Currently Amended) The system of claim 15, wherein the processor further

determines ~~when~~ whether a first variable of the larger data type may be replaced by a

second variable of a smaller data type having the reduced precision; and

replaces the first variable of the larger data type by the second variable of the

smaller data type as determined.

17.   (Original)   The system of claim 16, wherein the processor replaces the

operation and replaces the first variable to provide vector operations on small fixed-point

data types.

18.   (Currently Amended) The system of claim 17, wherein the processor is equipped

to provide MMX instructions ~~equipped~~.

19.   (Currently Amended) The system of claim 17, wherein the processor is equipped

to provide SSE instructions ~~equipped~~.

20.   (Original)   The system of claim 18, wherein the processor performs algebraic simplification on the code.

21.   (Currently Amended) The system of claim 19, wherein the language implementation system performs the bitwise constant propagation by abstract interpretation on the code.

22.   (Currently Amended) A system, comprising:

      means for analyzing code associated with a language implementation system

          using bitwise constant propagation;

      means for determining, based on the analyzed code, when whether an operation

          on a larger data type may be replaced by the an operation on a smaller data

          type having a reduced precision, wherein the operation on the larger data type

          is contained in the code associated with a language implementation system;

          and

      means for replacing the operation on the larger data type by the operation on the

          smaller data type as determined.

23.   (Currently Amended) The system of claim 22, further comprising:

      means for determining when whether a first variable of the larger data type may

          be replaced by a second variable of a smaller data type having the reduced

          precision; and

means for replacing the first variable of the larger data type by the second variable

of the smaller data type _as determined_.

24.   (Original)   The system of claim 23, wherein the means for replacing the

operation and the means for replacing the first variable are used for automatic

vectorization for signal and media processors that provide vector operations on small

fixed-point data types.

25.   (Currently Amended) The system of claim 24, wherein the processors are

equipped to provide MMX instructions ~~equipped~~.

26.   (Currently Amended) The system of claim 24, wherein the processors are

equipped to provide SSE instructions ~~equipped~~.

27.   (Original)   The system of claim 24, further comprising means for performing

algebraic simplification on the code.

28.   (Currently Amended) The system of claim 27, wherein the language

implementation system performs _the_ bitwise constant propagation by abstract

interpretation on the code.